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WE CLAIM:

1. An isolated or recombinant immunogenic polypeptide which comprises, mimics or cross-reacts with a B-cell or T-cell epitope of a *Lawsonia spp.* OmpH polypeptide.
2. The isolated or recombinant immunogenic polypeptide of claim 1 capable of eliciting the production of antibodies against *Lawsonia spp.* when administered to an avian or porcine animal.
3. The isolated or recombinant immunogenic polypeptide of claim 1 capable of conferring a protective immune response against *Lawsonia spp.* when administered to an avian or porcine animal.
4. The isolated or recombinant immunogenic polypeptide of claim 2 wherein the *Lawsonia spp.* is *L. intracellularis*.
5. The isolated or recombinant immunogenic polypeptide of claim 3 wherein the *Lawsonia spp.* is *L. intracellularis*.
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6. An isolated or recombinant immunogenic polypeptide selected from the following:
 - (i) a peptide, oligopeptide or polypeptide which comprises an amino acid sequence which has at least about 70% sequence identity overall to the amino acid sequence set forth in SEQ ID NO: 1;
 - (ii) a homologue, analogue or derivative of (i) which mimics a B-cell or T-cell epitope of a *Lawsonia spp.* OmpH polypeptide.
7. The isolated or recombinant immunogenic polypeptide of claim 6 capable of eliciting the production of antibodies against *Lawsonia spp.* in a porcine or avian animal.
8. The isolated or recombinant immunogenic polypeptide of claim 7 capable of conferring a protective immune response against *Lawsonia spp.* in a porcine or avian animal.

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9. The isolated or recombinant immunogenic polypeptide of claim 8, capable of inducing humoral immunity against *Lawsonia spp.* in a porcine or avian animal.

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A4 10. The isolated or recombinant immunogenic polypeptide of claim 9, capable of inducing humoral immunity against *Lawsonia spp.* in a porcine animal.

11. The isolated or recombinant immunogenic polypeptide of claim 8 wherein the *Lawsonia spp.* is *L. intracellularis*.

12. The isolated or recombinant immunogenic polypeptide of claim 10 wherein the *Lawsonia spp.* is *L. intracellularis*.

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A5 13. The isolated or recombinant immunogenic polypeptide of claim 6 that comprises the amino acid sequence set forth in SEQ ID NO: 1 or the amino acid sequence encoded by the OmpH-encoding nucleotide sequence of pALK13 (ATCC 207196) and is capable of eliciting the production of antibodies against *Lawsonia intracellularis* when administered to an avian or porcine animal.

14. The isolated or recombinant immunogenic polypeptide of claim 13 that consists essentially of the amino acid sequence of SEQ ID NO: 1 or the amino acid sequence encoded by the OmpH-encoding nucleotide sequence of pALK13 (ATCC 207196).

15. The isolated or recombinant immunogenic polypeptide of claim 13 or 14 capable of inducing a protective immune response against *Lawsonia intracellularis* in a porcine or avian animal.

16. The isolated or recombinant immunogenic polypeptide of claim 15 capable of inducing a protective immune response against *Lawsonia intracellularis* in a porcine animal.

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Al 17. A vaccine composition for the prophylaxis or treatment of infection of an animal by *Lawsonia spp.*, said vaccine composition comprising an immunogenic component

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which comprises an isolated or recombinant polypeptide having at least about 70% sequence identity overall to the amino acid sequence set forth in SEQ ID NO: 1 or an immunogenic homologue, analogue or derivative thereof which is immunologically cross-reactive with *Lawsonia intracellularis*; and one or more carriers, diluents or adjuvants suitable for veterinary or pharmaceutical use.

18. The vaccine composition according to claim 17 wherein the *Lawsonia spp.* is *L. intracellularis*.

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19. The vaccine composition according to claim 18 wherein the immunogenic component comprises an isolated or recombinant polypeptide that comprises the amino acid sequence set forth in SEQ ID NO: 1 or the amino acid sequence encoded by the OmpH-encoding nucleotide sequence of pALK13 (ATCC 207196)..

20. The vaccine composition of claim 19, wherein the immunogenic component consists essentially of the amino acid sequence of SEQ ID NO: 1.

21. A combination vaccine composition for the prophylaxis or treatment of infection of an animal by *Lawsonia spp.*, said vaccine composition comprising:

- (i) a first immunogenic component which comprises an isolated or recombinant polypeptide having at least about 70% sequence identity overall to the amino acid sequence set forth in SEQ ID NO: 1 or an immunogenic homologue, analogue or derivative thereof which is immunologically cross-reactive with *Lawsonia intracellularis*;
- (ii) a second immunogenic component comprising an antigenic *L. intracellularis* peptide, polypeptide or protein; and
- (iii) one or more carriers, diluents or adjuvants suitable for veterinary or pharmaceutical use.

22. A vaccine vector that comprises, in an expressible form, an isolated nucleic acid molecule having a nucleotide sequence that encodes an isolated or recombinant immunogenic polypeptide which comprises the amino acid sequence set forth in SEQ

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ID NO: 1, such that said immunogenic polypeptide is expressible at a level sufficient to confer immunity against *Lawsonia spp.*, when administered to a porcine or avian animal.

23. The vaccine vector of claim 22 wherein the immunogenic polypeptide is expressed using the steps of:

- (i) placing an isolated nucleic acid molecule which comprises the nucleotide sequence set forth in SEQ ID NO: 2 or degenerate variant, a homologue, analogue or derivative thereof which has at least about 70% sequence identity thereto, in operable connection with a promoter sequence;
- (ii) introducing the isolated nucleic acid molecule and promoter sequence of step (a) into the vaccine vector; and
- (iii) incubating, growing, or propagating the vaccine vector for a time and under conditions sufficient for expression of the immunogenic polypeptide encoded by said nucleic acid molecule to occur.

24. The vaccine vector of claim 23 wherein the *Lawsonia spp.* is *L. intracellularis*.

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25. A polyclonal or monoclonal antibody molecule that is capable of binding specifically to a OmpH polypeptide or a derivative of a OmpH polypeptide that is derived from *Lawsonia spp.* and has at least about 70% sequence identity overall to the amino acid sequence set forth in SEQ ID NO: 1.

26. The antibody molecule of claim 25 wherein the OmpH polypeptide or derivative thereof comprises the amino acid sequence set forth in SEQ ID NO: 1.

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27. A method of diagnosing infection of a porcine or avian animal by *Lawsonia intracellularis* or a microorganism that is immunologically cross-reactive thereto, said method comprising the steps of contacting a biological sample derived from said animal with the antibody molecule of claim 25 for a time and under conditions sufficient for an antigen:antibody complex to form, and then detecting said complex formation.

28. The method of claim 27 wherein the biological sample comprises whole serum, lymph nodes, ileum, caecum, small intestine, large intestine, faeces or a rectal swab derived from a porcine animal.

29. A method of identifying whether or not a porcine or avian animal has suffered from a past infection, or is currently infected, with *Lawsonia intracellularis* or a microorganism that is immunologically cross-reactive thereto, said method comprising contacting blood or serum derived from said animal with the immunogenic polypeptide of claim 1 for a time and under conditions sufficient for an antigen:antibody complex to form and then detecting said complex formation.

30. An isolated nucleic acid molecule which comprises a sequence of nucleotides which encodes, or is complementary to a nucleic acid molecule that encodes, a peptide, oligopeptide or polypeptide selected from the group consisting of:

(i) a peptide, oligopeptide or polypeptide which comprises an amino acid sequence which has at least about 70% sequence identity overall to the amino acid sequence set forth in SEQ ID NO: 1; and

(iii) a homologue, analogue or derivative of (i) which mimics a B-cell or T-cell epitope of *Lawsonia spp.*

31. The isolated nucleic acid molecule of claim 30, wherein the peptide, oligopeptide or polypeptide comprises the amino acid sequence set forth in SEQ ID NO: 1 or the amino acid sequence encoded by the OmpH-encoding nucleotide sequence of pALK13 (ATCC 207196) or a B-cell epitope or T-cell epitope thereof.

32. The isolated nucleic acid molecule of claim 31 comprising the nucleotide sequence set forth in SEQ ID NO: 2 or a complementary nucleotide sequence thereto, or a degenerate variant thereof.

33. The isolated nucleic acid molecule of claim 32 consisting essentially of the nucleotide sequence of SEQ ID NO: 2 or a degenerate variant thereof.

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34. A method of detecting *Lawsonia intracellularis* or related microorganism in a biological sample derived from a porcine or avian animal subject, said method comprising the steps of hybridising one or more probes or primers derived from the nucleotide sequence set forth in SEQ ID NO: 2 or a complementary nucleotide sequence thereto to said sample and then detecting said hybridisation using a detection means.

35. The method of claim 34 wherein the biological sample comprises whole serum, lymph nodes, ileum, caecum, small intestine, large intestine, faeces or a rectal swab derived from a porcine animal.

36. The method of claim 34 wherein the detection means comprises any nucleic acid based hybridisation or amplification reaction.

37. A probe or primer having at least about 15 contiguous nucleotides in length derived from SEQ ID NO: 2 or a complementary nucleotide sequence thereto.

38. A plasmid designated pALK13 (ATCC Accession No. 207196).

39. The combination vaccine according to claim 21 wherein the second immunogenic component comprises an antigenic *L. intracellularis* peptide, polypeptide or protein selected from the group consisting of SodC, FlgE, hemolysin and autolysin.